Vaisala T/RH Verification Check

I. Purpose:

This procedure checks the Vaisala HMP35A Relative Humidity and Temperature Probe by comparison with Vaisala HMI31/HMP35 Relative Humidity and Temperature Meter.

II. Cautions and Hazards:

- Positioning the insulating container in a shaded location improves readings.
- Since AC power is used for the ventilator and computer, do not conduct this procedure if rain is likely.

III. Requirements:

- Calibrated Humidity Probe
- Insulated Box Calibration Ventilation Assembly (Same design as T/RH ventilator with battery powered fan)
- Computer (Laptop with Tattletail Logger software)
- HMI31/HMP35 Relative Humidity and Temperature Meter
- Meteor AG Chilled Mirror System

IV. Procedure:

A. Ventilated Stand Comparison:

1. Attach comparison ventilator with Vaisala handheld, calibrated T/RH sensor next to the stand T/RH ventilator.
2. Connect AC power to ventilator with extension cord (at least two outlets needed for ventilator and computer).
3. Allow 15 minutes to equilibrate T/RH sensor.
4. Connect Laptop or Psion (see Psion application procedure) or laptop to SMET datalogger.
5. Read and document simultaneous T and RH from both sensors in SMET calibration record form if temperature differ by more than ±0.5° C and/or ±4% RH; contact mentor for advice on correction or replacement.

B. Insulated Box Comparison:

(Only needed when ventilated comparison is not possible.)

1. Place insulated box in shaded location.
2. Remove the probe designated for checking from the radiation shield.
3. Remove the protective filter from the designated probe.

   Note: replace filter protector without filter to protect T/RH sensors from damage. If water bath is used, put probes in rubber glove finger or other waterproof covering.
4. Put the reference probe and the designated probe into the insulated box.
5. Take temperature and relative humidity readings until all readings stabilize (temperature within ±0.2° C and RH with ±0.5% RH.

   Note: If the box was placed in the sun, the temperature drifts slowly upward and RH drifts slowly downward.
6. Take and record temperature and relative humidity readings from both.
7. If the difference between the reference and probe temperature is greater than 0.5° C, the probe is in need of replacement; then perform a check on the new probe.
8. If the relative humidity of any probe differs from the reference by more than ±3% RH for values below 90% or ±4% RH for RH values above 90%, replace the probe; then perform a check on the new probe.
9. Return the probe to the aspirator shield following all calculations or if further calibrations are required, refer to PRO(TRH)-003 to calibrate the probes.
10. Enter date, start-time, end-time, and any comments on the DAQM Calibration Form.

C. Chilled Mirror Comparison:

1. Tape chilled-mirror (CM) cable to stand T/RH ventilator so that CM is close to the T/RH probe.
2. Insert temperature probe into ventilator near sensor being careful not to block airflow from the aspirator.
3. Attach chilled-mirror control unit to laptop computer (if you use the same computer to talk to the SMET logger, close the port and reopen it to talk to the CM).
4. Run TxTools software (see attachment 1) and collect about one hour of one-minute data for comparison with the SMET logger T and RH data.

5. Run Tattletale compare software to compare the data (under development).
6. Document comparison and follow procedures above if differences more than ±0.5° C or ±4% RH. (Step A-.5)

V. References:

1. Dick Hart, "Procedure for Using Vaisala HM131/HMP35 Relative Humidity and Temperature Meter to Perform Six Month Verification Checks of Relative Humidity and Temperature Probes," December 16, 1995.

VI. Attachments:

1. Tattletale Software Process

Attachment 1: Tattletale Software Process

1. →cd ttale →directory
2. → txtools →terminal window
3. →plug in tattletale (*May have to plug in battery as the tattletale me be in the sleepmode; upon plugging in the batter turn ON switch.)
4. Get message below:

   Tattletale Model 5.10

   Txbasic Version 4.0z

   © Onset Computer Corporation

   All rights reserved
5. **#** [tattletale prompt]
6. Alt-F
7. Open ↵ [return]
8. Mirror^{2}txb [tab, ↓ to get to files] [OPEN]
9. Alt R d
10. Year
11. Mon
12. Day
13. Hour
14. Secs
15. [Return to sync time]
16. Disconnect tattletale and place on Package
17. Reconnect tattletale after running through the night (Chilled-Mirror will run about 8 hours on 1 9 Volt battery)
18. Cntrl C will stop data and allow for download while testing the tattletale.
19. Data: 16:54:01 0.00488-V0 0.00488-V1 –0.02197-V2 –0.03662-F3

    Alt 0

    Cntrl-C

Port Setup

Port:	1
Baud:	19,200
Data:	8
Stop:	1
Parity:	N
Handshake:	None

To Offload

1. Cntrl C (note the number of bytes total and enter this number after Alt O command as the end address. See **Txtools** below)
2. Disconnect computer from tattletale.

Txtools

1. Connect computer to tattletale—data appears.
2. Cntrl C
3. Hit return
4. Alt O to offload
5. Enter “start address 0”
6. Enter “end address” fo filesize
7. Name offload file ↵